

DRAFT June 14, 2005 TWS

June 8, 2005 10AM-12 Noon

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Climate Variability & Change Impacts Subcommittee, AZ Forest Health Advisory Council

Minutes:

Introductions of all present: Mike Crimmins, Alix Rogstad, Melanie Lenart, Taylor McKinnon, Steve Archer, Julio Betancourt, Gregg Garfin, Chris Jones, Steve Gray, Tom DeGomez, Marty Drozdoff, and Neill Cobb by speaker phone, Tom Swetnam.

Description of sub-committee charge and objectives by the chair (Tom Swetnam) – Dr. Swetnam announced that this is an open meeting and the public is invited. Approximately 10 other individuals have stated an interest in the subcommittee and they will be included in future email communications. We will be having a series of meetings. The context of the meeting is under the Governor's Forest Health Advisory Council (FHAC), for providing advice, and scientific and technical input to the Governor. FHAC has about 20 members and works with the Forest Health Oversight Council, which deals more with policy.

The initial charge of the Climate Variability & Change Impacts Subcommittee (CVCIS) is to assemble a white paper on climate variability & change impacts of AZ woodlands and forests. The document would be written for the Governor's office, and other policy makers, but also accessible to managers and the public. In addition to the technical white paper, we also wish to do an executive summary as a glossy publication.

In a related initiative, the Governor has issued a proclamation assembling a Climate Change Advisory Group to address climate change issues including greenhouse emissions. The CVCIS white paper and other products produced by this subcommittee may be useful to the Climate Change Advisory Group, and the chair will be sure that the new board is aware of and briefed on the subcommittee's work.

Dr. Swetnam noted that the Governor of California recently announced new policies on greenhouse gas emissions, and that California has been engaged in assessing climate change science and potential climate change impacts. They have produced a number of white papers on these topics. A website called the "California Climate Change Portal" contains links to many of these documents:

<http://www.climatechange.ca.gov/>

Tom suggested we view the white paper by Rebecca Shaw out of California as an example of white paper on ecosystem impacts of climate variability.

General discussion of the white paper planning:

A white paper will be very useful for informing state policy on climate change. Marty asked about impacts on the Colorado River and its water resources. Dr. Swetnam reiterated that the charge of the subcommittee is to focus on the forests and woodlands. The information we provide in the white paper will assist decision making dealing with water resources.

At this time, there is no specific funding for developing the white paper, meaning the subcommittee work is voluntary. [Subsequent to the meeting, Tom Swetnam had a discussion with Neil Cobb, and Neil offered \$5,000 support for help in developing the white paper from the NSF DIRENET grant to NAU and partners. These funds will be used to help develop graphics and defray costs in assembling and producing the paper.]

Melanie asked about modeling that will be used for our project. Tom is suggesting that we use and adapt models that exist, or can be taken “off the shelf” rather than engage in lengthy or difficult new model development and testing.

The white paper will be about 20-30 pages, well detailed but not too technical. The first level audience is the Governor and her staff. The white paper will be published by the FHAC using the Governor’s resources.

Julio added that there could be interest outside of Arizona for the information in the white paper. He suggests that it may be broadened to include forests outside of Arizona as well as other ecosystems, including rangelands, deserts and riparian areas. Discussion for the pros and cons of Julio’s suggestion ensued. Tom reiterated that we have a timeframe to deal with, and that gives justification for keeping it to forests and woodlands. Julio added that there has not been an in-depth temperature analysis done for Arizona either. Tom said we need to move forward with a product, and design it so that additional modules (or other white papers) could be produced later.

Melanie asked about whether we keep it focused on Arizona, or include other Southwestern states, such as New Mexico. To make a quick product, we still need to focus on the state. The opportunity cost is broader acceptance if a peer-review paper were published, but this would probably require a broader Southwest coverage, and perhaps a general ecosystems scope. After some discussion, it was decided that, at this time we should focus on the state level and forests and woodlands, so that a relatively succinct document could be produced in the next 9 to 12 months.

At this time, Tom moved us on to discuss the strawman outline of the white paper (as attached here). Discussion ensued on components and details to include. Tom described the general draft framework as: review history of past climate variability and impacts, review current (recent) climate events and forest and woodland responses (e.g., drought, fires, insect outbreaks, tree dieoff), present scenarios of potential future climate

variability and change, and discuss potential implications for forest and woodland resources and management.

Julio emphasized that we will need to be managing for climate variability, the season to season and year to year changes, headed toward a predicted climate change at a point in the future. Managing for variability may be as important, or more important, than managing for gradual or abrupt changes in climate. There is enough “natural variability” in past AZ climate that recognizing and dealing with this variability will be a great challenge, even in the absence of climate change. This reality needs to be addressed and communicated, as this variability is what we will be experiencing, day to day, year to year, etc.

Julio and Steve Gray passed out a pair of graphs to show the difference between the straight line climate shift over time, and the unsmoothed peaks and troughs over time.

Our emphasis needs to be on how to manage these forests, woodlands, and related resources, and keep a balance on the social issues. We need to manage for variability.

Additional discussion included carbon sequestration, public scenic preferences, and other policy and political points. Julio said there is a current push toward local management, but within a regional planning framework. We need to emphasize the need to keep the broad scales in mind, including climate variability and change, as policies and management activities are pursued at sub-regional, and local levels.

Gregg moved the discussion on to how we will bring out the “take-home points” as the paper is also meant to inform policy making. One shift Tom and Julio have seen over the past ten years is more public and media acceptance of climate as a factor in vegetation management. An example is the development of “predictive services” groups within regional and national fire management. Some of the points and implications include:

- Climate variation and change as two-sides of the same coin, or a continuum
- Regional management implications (vs. local scale)
- Winter variation is synchronized at region scale
- Monitoring recruitment after disturbance, and phenology monitoring – monitoring network and best how to (as an appendix)
- How does the above fit into modeling, and the models we need
- Uncertainty of events
- Carbon Emissions
- Trigger events/indicators

Various other ideas, comments:

It was noted that we can draw a lot information from the “Fact sheets” being developed by the Climate and Vegetation Change Working Group at the UA, and the summaries of presentations at the climate impacts meeting that was held in Sedona in March.

We need to engage more individuals from the “stakeholder” community in this effort. It was suggested that Tom and others would work to contact additional individuals in agencies and NGOs asking if they would participate or help review drafts.

In addition to the white paper, we should also consider developing a PowerPoint or other type of visual presentation that summarizes the white paper’s elements. A presentation that could be given by any number of people, and taken “on the road”, to convey the information in a visually compelling way, other than in just a printed document.

During the final 30 minutes: Identification of tasks, responsibilities, and schedule.

It was decided that we would begin by assembling several pieces of information, graphics, and short text segments for the white paper. The idea is for individuals and small groups to begin assembling key graphics or tables to use and short text segments describing them, which can then be assembled and added to later. Additional pieces needed to be identified at subsequent meetings. The first items to be developed included:

A summary of the past century of climate variability in AZ or SW from instrumental data, e.g., temperature and precipitation time series, and also key indices, such as growing season length changes. (Gregg Garfin, Mike Crimmins to work on this)

A summary of long-term climate changes in the SW from tree-rings or other paleo-reconstructions (Steve Gray, Julio, and Tom to work on this)

A summary of past and recent climate events and impacts on forests and woodlands (Tom DeGomez and Tom Swetnam to work on this).

Begin reviewing literature and evaluating CO2 effects and carbon emission/sequestration issues (Melanie Lennart)

See about obtaining regional, general circulation model scenarios for Arizona or Southwest, to show potential climate changes in green house gas warmed world (Gregg Garfin to check on possibility of obtained from Linda Mearns, NCAR and Henry Diaz, NOAA)

See about obtaining model runs of potential future vegetation changes in Arizona or SW from Ron Neilson’s dynamic vegetation modeling group (MAPPS) (see example of what was produced for CA at:

<http://www.climatechange.ca.gov/research/index.html>

scroll down to the maps on this page) (Tom will talk with Ron about this)

**The charge is for the above named individuals to begin work on these pieces, and to be ready to deliver first drafts of them if possible at the July meeting.**

Tom will coordinate with committee members via email for a mid to late July meeting date, and probably at a location in Phoenix.

Strawman draft outline of white paper on “Climate Variability & Climate Change Impacts on Arizona (or Southwest?) Woodlands and Forests”

June 6, 2005

Executive Summary

I. Introduction

A. Importance of climate variability and change in managing AZ forests and woodlands, for anticipating, mitigating, and adapting to climate variations & change

B. Objectives of this white paper

1. succinctly review what we know & don't know about climate variability and change in AZ/SW that is important to forest ecosystems and forest health
  - a. past climate variations and changes and impacts
  - b. current climate variations and changes and impacts
2. to identify key issues and at-risk forest resources and values (“at-risk because of current or future extreme climate variability and change
3. to portray/describe possible future climate variation and change impact scenarios
4. to identify key policy and management implications of past, current, and potential future climate impacts
  - a. implications for forest fire fighting
  - b. implications for forest restoration, fire hazard reduction, forest remediation and recovery
  - c. implications for other natural resources, watersheds, etc.
  - d. implications for WUI planning
  - e. implications for carbon emissions reduction and management

II. Past climate variability and woodland/forest responses

A. past climate variations

1. summarize key instrumental datasets of temperature, precipitation, growing season length, etc. for past 100 or so years... Show these in nice graphics and/or tables

2. summarize key tree-ring reconstructions showing precip, temperature and drought time series over past 300 to 1,000+ years in the SW

- B. fire-climate responses
- C. fire-insect and pathogen responses
- D. forest & woodland tree demographic processes (mortality & recruitment)

### III. Current climate conditions, and recent climate and weather-related forest and woodland responses

- A. fire-climate responses
- B. introduced species (e.g., non-native grasses) and fire-climate interactions
- C. fire-insect responses
- D. forest & woodland tree demographic processes (mortality & recruitment), and other implications of climate variability and change impacts (e.g., genetic bottlenecks, vegetation type conversions)

### IV. Potential future climate variability and change, and impacts scenarios

- A. succinct review of results of recent, regionalized global circulation model results for the Southwestern US, include discussion of uncertainties
- B. Discuss potential fire, insect, pathogen, tree demography, type conversion, etc. etc. responses to climate change scenarios
  1. possibly use examples from Ron Neilson's MAPPs model to project potential future fire scenarios, and type conversions
  2. identify carbon emissions and sequestration issues under various scenarios, possible also using MAPPs, or other carbon accounting model

### V. Key policy and management implications

- A. implications for forest fire fighting
- B. implications for forest restoration, fire hazard reduction, forest remediation and recovery
- C. implications for other natural resources, watersheds, etc.
- D. implications for WUI planning
- E. implications for carbon emissions reduction and management

### VI. Conclusions and Recommendations